

## **CHAPTER 4: IMPACT ANALYSIS**

### **4.1 INTRODUCTION**

Chapter 4 describes effects on the human environment of the proposed action and other alternatives described in Chapter 2.

Environmental consequences can be categorized and presented in many ways. Some are the direct effect of implementing an action. Others are more indirect, occurring later or farther away. Some tend to be short term. Others last longer. Some effects are adverse. Others are beneficial. Some are mainly physical or biological. Others are economic or social. This chapter discusses environmental consequences in all of these ways.

We have done an analysis of the Standards in each Alternative, based upon whether the standards addressed the fundamentals of rangeland health, as required in the regulations at 43 CFR 4180.2 (Fed. Reg. 1995). Although there are some differences in the way the standards are worded, all of the alternatives except the fallback standards address the fundamentals of watershed function, nutrient cycling and energy flow, water quality, and habitat for special status species and native plant and animal populations. Some of the differences are highlighted in the analysis, while Appendices 14 and 15 specifically address the soils and water quality standards.

We have also done an analysis of the guidelines under the different alternatives. In all cases the guidelines contain the necessary tools to enable us to meet the standards of rangeland health. In some cases, the guidelines do not specifically address certain topics as directed by the regulations, and there may be some concern that this failure to directly address those topics would result in failure to meet the standards. These concerns are addressed in some of the following analysis, while a table showing this analysis and comparison is in Appendix 16.

Appendix 19 is a summary table that shows a side-by-side comparison of the impacts for each alternative as identified in this chapter.

### **4.2 IMPACTS COMMON TO ALL ALTERNATIVES**

#### **4.2.1 GRAZING MANAGEMENT**

As required by the regulations, the fallback standards and guidelines (identified in Alternative 3) became effective on August 12, 1997. These are interim standards and guidelines which will be applied to all BLM grazing allotments until state-wide standards and guidelines are developed and approved. In order to prepare for complying with the fallback standards and guidelines, as well as any subsequent standards and guidelines that may be developed through this current process, the field offices evaluated current information obtained from past monitoring and from records regarding current conditions with a focus on the fundamentals of rangeland health. Where information was available, each field office identified which allotments were meeting or making significant progress toward meeting standards based upon the following primary topics for rangeland health: soils (including soil

erosion), riparian and wetland function, water quality, and habitat (including healthy plant communities and animal habitats).

Out of 459 allotments assessed, 387 were identified as meeting standards (Category 2 -- see explanation of implementation categories in Chapter 2). These allotments are identified in the implementation plan in Appendix 21. Fifty-nine (59) of the allotments assessed did not meet at least one of the standards due to current livestock grazing practices. These allotments are identified in the Category 1 table in Appendix 21. The severity, scale, and overall magnitude of the conditions not being met are not known at this time for every allotment. This information will be identified in the site-specific evaluations that are currently underway. There were 13 allotments identified as not meeting standards due to causes other than grazing. These causes included fire (or lack thereof), roads, recreation, mining, wild horses or burros, and weed infestation. Note that the number of allotments differs from the number included in the draft EIS for the reasons described in Chapter 3, Section 3.2.1.

Current rangeland health conditions are not yet known on 190 allotments (about 29% of the allotments in the EIS area) and are not included in the present grazing and economic analysis. In many of these cases, these are "C" or custodial allotments that have not received sufficient monitoring to produce data on ecological conditions. Some other types of allotments (I and M) also lack up-to-date ecological condition assessments, mainly as a result of past budget limitations. Because most of these allotments are quite small, the proportion of acreage not included in this analysis is much lower than the proportionate number of allotments.

Implementation of any of the alternatives would approach meeting the fundamentals of rangeland health where the cause is from current grazing related activities. Allotments where causes other than grazing are the reasons for the fundamentals not being met, are outside of the scope of this analysis and the alternatives identified would not specifically correct those problems.

The consequences of implementing the management measures and the rate of implementation predicted would basically be the same in Alternatives 1, 2, and 3. The consequences would be different from these in implementing the rapid improvement/rapid recovery alternative -- Alternative 4, and the preferred alternative -- Alternative 5, in that both the rate in achieving improvement in rangeland health conditions and the implementation of the alternative would cause some different consequences.

In all alternatives there would be a need to implement or install range improvement projects to facilitate the enhancement of vegetative conditions either through vegetative treatment practices and weed control or to place facilities on the rangelands to support the grazing management of livestock. Many of the areas known to be in need of these projects are within Wilderness Study Areas or designated Wilderness Areas, predominately within the Great Basin Floristic Province. The management policies for these areas are restrictive about the type of projects that may be placed in these areas as well as the methods for implementing or installing the projects. The projects must be compatible with the existing or potential values for wilderness. Current policy guidance is that no projects may be developed within Wilderness Study Area unless they would enhance the wilderness values. Prior to implementation, each individual project would require a site-specific analysis in weighing any projected wilderness enhancement values from the project against the magnitude of the predicted impairment of these values that could occur from the project itself or influences from

the use of the project. Therefore, there is an assumption that the opportunities to implement some of the needed range improvement projects within these areas would be limited and would affect all alternatives to the same degree.

There will be reductions and limitations of grazing use on some allotments under all alternatives in order to restore soil and vegetative conditions and minimize existing impacts from grazing activities. This would result in a decrease of the number of AUMs of grazing authorized due to shortening or changing the season of use, establishing grazing utilization thresholds, or excluding areas from grazing.

All of the alternatives include using herding practices, constructing new fences, installing additional livestock watering sources, and changing the class of livestock to facilitate improved grazing use that will result in meeting rangeland health conditions.

See Section 4.3.1 for a description of major differences between the alternatives.

## **4.2.2 UPLANDS**

### **4.2.2.1 Soils**

Implementing the rangeland health standards and guidelines will result in positive impacts to upland soils which will improve overall watershed health slowly over a long time frame. Grazing management that results in greater plant litter retention will have slow but complex results. Surface litter plays a complex role in range soil health. It cycles plant and animal nutrients, reduces raindrop impact, traps mobilized sediment, insulates and moderates soil temperatures, conserves soil moisture, and builds soil structure. The changes expected to occur are: reduced surface crusting, reduced erosion, increased biological activity, increased permeability, increased root mass, increased fertility, increased soil cover, and increased soil moisture.

Many Field Offices have allotments with noxious weeds and invasive weeds which may inhibit attainment of soil condition standards. Specifically the standards requiring "a variety of root depths, diversity of plant species and representation of the desired plant community" are not being met. For example, the Susanville RAC Area has at least three grazing allotments that resource managers suspect will not meet the soil condition standards regardless of which alternative is implemented. Approximately 20 percent of these allotments contain areas which are dominated by medusahead, an exotic annual grass species which is extremely difficult to eradicate. Other Field Offices have grazing allotments with areas dominated by yellow star-thistle which will not significantly change under any alternative. The long recovery times or high treatment costs associated with making significant progress in these weedy areas indicate that implementation of any of the alternatives would not significantly change this condition.

See Section 4.3.2.1 for a description of the major differences between the alternatives.

#### **4.2.2.2 Vegetation**

##### **Annual Grasslands**

No changes are expected in the species composition of annual, herbaceous species, since the residual dry matter (RDM) level guidelines to be adopted under all of the alternatives are basically the same as those that are currently employed. There will be a slight expansion of RDM guidelines to include some lower priority, C-category allotments that were previously excluded from these requirements, particularly in the area managed by the Hollister Field Office. The amount of public lands in these allotments, however, is small. This change, therefore, is considered to be minimal.

Where desired plant community objectives specify them, perennial grasses are expected to increase under all alternatives. Episodic recruitment of oaks and shrubs (especially allscale in the San Joaquin Valley) will be allowed to occur through reduction or removal of grazing and browsing pressure on these species during the critical period of establishment. There will likely be no change in fire frequency, except where prescribed burns are employed to establish perennial grasses, to improve the habitat for special status species, or to manage fuel levels.

The rate of change is expected to be similar for all alternatives.

##### **Sagebrush Steppe**

The following changes are expected to occur under all alternatives:

- \* Increased cover and vigor of perennial grasses, where these now occur or are likely to occur based upon the availability of seeds in the seedbank.
- \* Increased potential to move through successional stages or have a variety of seral stages on the landscape.
- \* Increased soil cover of both live vegetation and litter.
- \* More uniform distribution of litter and incorporation of litter into the soil profile.
- \* Better root distribution throughout the available soil profile.
- \* Increased species diversity.
- \* Increased photosynthetic period.
- \* Increased vegetation structure.
- \* Increased frequency of wildfires due to higher accumulation of live vegetation and litter.
- \* Decreased rates of juniper expansion due to mortality of young trees from increases in fire frequency.
- \* Increased diversity of age classes of aspen.

- \* Where desired plant community objectives include a shrub component, shrubs will be maintained or increased, and their vigor improved.
- \* Where desired plant community objectives do not include a shrub component, shrubs may decrease because of increased competition from perennial grasses and forbs.
- \* Episodic recruitment of shrubs, trees, and perennial herbs will be allowed to occur by reducing or removing grazing and browsing pressure during the critical period of establishment.

These changes are expected to be fastest under Alternative 4. They are expected to be the slowest under Alternative 3 because of the lack of utilization guidelines for perennial key species under that alternative. Under Alternatives 1 and 2, changes will likely be faster for the area covered by the Bakersfield and Ukiah RACs because of the more conservative utilization guidelines adopted by those RACs over that of the Susanville RAC. Although Field Offices covered by the Susanville RAC would develop site-specific utilization guidelines, this would take time to accomplish and therefore slow down the pace of the changes indicated above. The Susanville RAC has adopted interim utilization guidelines, but these are basically the same as in existing land use plans, and are not as conservative as those adopted by the Bakersfield and Ukiah RACs. Therefore, these interim guidelines are not expected to result in any changes in the short term. Under Alternative 5, the preferred alternative, utilization limits similar to those of Bakersfield and Ukiah are proposed for Susanville. This would result in similar rates of increase in all three RAC areas under that alternative.

#### **4.2.3 RIPARIAN-WETLANDS and STREAM CHANNELS**

##### **4.2.3.1 Overview**

In the Wetland/Aquatic section of Chapter 3 we discussed using the BLM's Functioning Condition Assessment process to judge the "health" of standing-water (Lentic) acres and flowing-water (Lotic) miles, and noted the fact that the process can also be used to estimate change in health status. Therefore, we used the Functioning Condition Assessment process to compare the current "health" status with the estimated status under management by alternatives. This was done via a Professional Judgement Assessment (PJA), where resource professionals were asked to use their own personal experience, skill, perspective, and familiarity with various wetland/riparian areas and streams to estimate future functioning condition ("health") status under the different alternatives. Table 4.2.3 shows the difference between current standing-water (lentic) acres "health" status and management under the different alternatives and Table 4.2.3(a) does the same for flowing-water (lotic) miles.

<b>TABLE 4.2.3: Lentic Habitat Functioning Status (%) Acres</b>						
<b>Status</b>	<b>Current</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>	<b>Alt. 4</b>	<b>Alt. 5</b>
Proper Functioning	27 %	83 %	83 %	83 %	83 %	83 %
At Risk	71 %	16 %	16 %	16 %	16 %	16 %
Non-Funct.	2 %	1 %	1 %	1 %	1 %	1 %

Both tables illustrate a major difference between current "health" status and estimated future "health" status through management under any of the alternatives; however, they also indicate that there would be no difference in future "health" status between alternatives. Under current management 27% of Lentic areas are in Proper Functioning Condition (PFC). It is estimated that management under any of the alternatives would increase the amount of Lentic areas in PFC to 83%. The Lentic habitats in PFC would increase from 28% to 62%. However, the time-frame for moving functioning-at-risk wetland/aquatic habitats into proper functioning condition would be shorter under Alternative 4 as Alternative 4 requires choosing the action that will improve the functioning condition as fast as possible, rather than a gradual approach.

<b>TABLE 4.2.3(a): Lotic Habitat Functioning Status (%) Miles</b>						
<b>Status</b>	<b>Current</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>	<b>Alt. 4</b>	<b>Alt. 5</b>
Proper Functioning	28 %	62 %	62 %	62 %	62 %	62 %
At Risk	69 %	36 %	36 %	36 %	36 %	36 %
Non-Funct.	3 %	2 %	2 %	2 %	2 %	2 %

Approximately 99.6% of the indicated change of At-Risk Lentic areas and 70% of the At-Risk Lotic areas moving to Proper Functioning status is the result of PJA data provided by the Surprise Field Office. This can be explained by the fact that Surprise manages approximately 10,000 acres more of standing-water wetlands and approximately 600 miles more of flowing-water riparian than the other nine offices combined. Also, the Surprise Field Office has a much higher percentage of the wetlands they manage currently in Functional-at-Risk status.

#### 4.2.3.2 Vegetation

The following changes are expected to occur under all alternatives:

- \* Increased shrub and tree layers, where the potential for these species exists.
- \* Improved age-class distributions of trees and shrubs.
- \* Increased cover and vigor of herbaceous perennial species.

- \* Increased streambank cover.
- \* Movement toward later seral stages.
- \* Increased diversity of plants and animals.
- \* Increased width of riparian zone.
- \* Decrease of nonriparian species (such as sagebrush and rabbitbrush) in the riparian zone, as the water table rises.

The above changes are expected to occur fastest under Alternative 5, Alternative 4 and under Alternatives 1 and 2 for the area covered by the Bakersfield RAC. This is because of the conservative minimum stubble heights and utilization guidelines adopted for the entire project area under Alternatives 5 and 4 and for the Bakersfield RAC under Alternatives 1 and 2.

The area covered by the Susanville RAC under Alternatives 1 and 2 will likely experience these changes faster than the Ukiah RAC under the same alternatives, because the Susanville RAC has adopted interim utilization guidelines that would take place immediately upon approval of the standards and guidelines, while the Ukiah RAC had directed that utilization levels be set on a site-specific basis.

Alternative 3 would result in the slowest rate of change, because all riparian utilization guidelines would be developed on a site-specific basis, a process that will take more time to implement.

The above changes would apply to most areas. However, areas that are severely degraded or non-functional would not be changed without major work, or they would take a much longer time to recover. There are some non-functional areas that may no longer have the potential for recovery.

#### **4.2.3.3 Riparian Hydrology and Water Quality**

Under all alternatives, we would see a general enhancement and improvement in riparian and wetland conditions. This improvement would be reflected in hydrologic function and water quality. As uplands and riparian areas improve, peak runoff would be reduced and increased riparian vegetation would protect and stabilize streambanks. Stream channels in many locations would narrow, and peak flows would be spread across the floodplain, thus increasing groundwater recharge. This increased groundwater recharge would increase the amount of streamflow throughout the year in perennial streams and increase the duration of streamflows in intermittent streams. Also, as peak flows spread across the floodplains, sediment would be deposited, enriching soils and building streambanks.

We would also see improvements in water temperatures (lower in summer and higher in winter) and dissolved oxygen levels due to improvements in stream channel morphology and increased growth of over-hanging vegetation that would shade the water. Increases in vegetation would also filter out more fecal material, thus reducing the amounts of nutrients and pathogens in the water. These improvement would occur a bit faster under Alternatives 4

and 5 as there is more focus and attention given specifically to water quality concerns under these alternatives.

Following Secretarial approval of the rangeland health standards, and the State of California's approval of the water quality plan with its Best Management Practices (see Appendix 10), BLM will manage livestock under both sets of guidelines to meet California's requirements for water quality for beneficial uses. BLM will do the same thing, using the rangeland health standards and the Best Management Practices in Nevada's plan, to manage livestock grazing to meet Nevada's water quality requirements.

Most of the concerns with livestock grazing activities meeting numerical drinking water objectives would be focused where the water would be directly used for drinking water without treatment or where it may be determined that treatment for potability requirements is infeasible due to the influence of livestock use. Most stockwatering facilities in Nevada and California are excepted from meeting numerical standards for drinking water.

There are some differences between alternatives. These are primarily in emphasis and specificity of direction, and are explained in Section 4.3.3.

## **4.2.4 WILDLIFE**

### **4.2.4.1 Wildlife Communities**

Implementation of the Standards for Rangeland Health would promote the ecological processes necessary to maintain and/or improve wildlife habitats in BLM grazing allotments. The standards have been developed as indicators of healthy rangelands and, as such, would promote the long-term quality of the living (biotic) and non-living (abiotic) components of wildlife habitats: food, cover, water, and space. Maintaining the processes of soil and plant community development would provide the mechanisms necessary for rangeland communities (and thus wildlife habitats) to exhibit resistance and resilience to extreme events such as drought, fire, or rainstorms (NRC 1994). However, the benefit or harm to a particular wildlife species, or group of species, would depend upon the current habitat condition, trend, and management objective(s) at the pasture or allotment level where the standards would be applied.

In general, the implementation of the standards would be expected to improve or maintain a wide variety of wildlife habitats on the BLM lands by an increase in vegetative ground cover, the diversity of plant species, and the variety of vegetative layers (grass, shrubs, young trees, mature trees). Where the potential exists, plant communities would trend to later seral stages that would include more grass and herbaceous cover, greater diversity of native plants, and an increased structure of shrubs and trees. However, as described in the vegetation section, many acres of upland perennial rangelands would not change in the composition or structure of native plant species in the short or long term since these species have been eliminated and seed sources are not available in the soils. The greatest changes are expected to occur in the wetland/riparian habitats where potential for vegetation change still exists. This would be an important improvement of wildlife habitat on BLM lands since these habitats represent the most productive habitats on the western rangelands (Thomas et al. 1980).



Habitat improvement would be the result of designing livestock management practices to meet the standard's indicators (e.g., ground cover, litter, variety of age classes, plant reproduction, streambank protection, water quality, etc.). This would also result in a wide variety of wildlife habitat elements necessary for diverse animal assemblages that occur when habitats provide a diversity of plant and animal foods, hiding, escape, nesting, and thermal cover, and more available water. Using migratory birds as an example, as the structure of the vegetation becomes more complex, opportunities for nest sites and food resources increase, allowing additional birds to inhabit the area (Douglas et al. 1992).

Based on the CWHR habitat models, wildlife habitat suitability would improve for many species of wildlife, while the same vegetation changes would reduce the habitat value for many others. In general, species that tend to be "generalists" in food and habitat selection are more abundant in open habitats and may find the increased vegetation cover less suitable. In contrast, species that are more sensitive to habitat structure, that also tend to be less abundant and of management concern, are benefitted by increased vegetative cover and the addition of shrub and tree layers. This is especially true for many neotropical migrant birds that readily respond to increased diversity and complexity of riparian and woodland vegetation.

### **Annual Grassland Habitats**

The implementation of the standards and guidelines would maintain a minimum level of residual dry matter (RDM) on the ground at all times of the year in both the long and short term periods. An emphasis on RDM would increase ground cover for nesting birds and small mammals. This would be beneficial for some species (e.g., meadow larks, lark sparrow, grasshopper sparrow, California vole, mule deer) but detrimental for others (e.g., western spadefoot, mountain plover, horned lark, American robin, Heermann's kangaroo rat, giant kangaroo rat, side blotched lizard, coachwhip snake). For many other species, the density of grass cover will have little discernable affect (CWHR 5.2 1996).

More noticeable effects to wildlife communities would be seen in the alkali shrub and oak woodlands where changes in shrub and tree cover and structure would determine which wildlife species would be present. Where allotment objectives include a shrub or woodland component, grazing management practices would be implemented to maintain or increase the amount of shrub/tree cover of native saltbush or oak species on appropriate sites. This would maintain or improve the structural diversity for animals requiring shrubs and trees for nesting, escape and thermal cover.

### **Sagebrush Steppe Habitats**

The proposed standards and guidelines would increase the vegetation structure and species diversity of the sagebrush steppe communities through the increases in cover and vigor of the perennial grass and herbaceous plant species. This would improve the quality of habitats for those species that respond to greater cover of plants and litter for feeding and concealment (e.g., western meadowlark, savannah sparrow, vesper sparrow, montane vole, Belding's ground squirrel, sagebrush lizard; Zeiner et al. 1990). Where shrub species are included as allotment objectives, the improvement and maintenance of sagebrush, bitterbrush, rabbitbrush, greasewood, mountain mahogany, service-berry, snowberry and other important cover and forage species would occur. These are important habitat elements for many wildlife species

such as mule deer, pronghorn, pygmy rabbit, white-tailed hare, sage grouse, Brewer's sparrow, sage sparrow, green-tailed towhee, and gray flycatcher (Zeiner et al. 1990).

The increase in the likelihood of wildfires from increased herbaceous cover would promote a mosaic of shrub and grassland habitats that would support a wide diversity of wildlife in the sagebrush communities. Since the pattern across the landscape would include an assortment of vegetation types and seral stages with more edges between habitats, the richness of wildlife species would increase over the long term (Thomas et al. 1979).

### **Juniper, Pinyon-Juniper**

The implementation of the standards and guidelines are expected to increase the amount of plant cover and litter that may influence fire fuels. As such, the amount of pinyon-juniper and juniper habitats is expected to be altered by the increase in the frequency, intensity and size of wildfires than may result from increased vegetation cover. The post fire communities would be beneficial for some species like mule deer (Stager and Klebenow 1986) and pronghorn in the short and long term as shrubs and forbs become more abundant. The loss of Pinyon trees would reduce seed crops for Pinyon jay, Clark's nutcracker, Steller's jay, scrub jay, and black-billed magpie, while reductions in juniper may affect Townsend's solitaire, American robin, and western bluebirds that depend on juniper "berries" during the winter months. In addition, the number of bird species breeding in these woodlands that are influenced by pinyon pine density, tree density, and foliage volume would be reduced within burned areas. However, the overall landscape across BLM lands is not expected to be altered to an extent that would place these wildlife species or communities at risk.

### **Wetland/Riparian Habitats**

The proposed standards and indicators will promote the maintenance of the process and functions necessary to improve and maintain healthy riparian habitats. Rosgen (1993) stated that from his measurements, over half of the total sediment produced in large watersheds is being contributed by accelerated bank erosion processes. He noted that streambank erosion rates can be reduced by several orders of magnitude if riparian vegetation is maintained. Rooting depth and density becomes a major key in streambank stability. Grazing strategies that change the density and composition of species with good rooting characteristics have an exponential impact on bank erosion. It has been demonstrated that good grazing practices can actually improve the stream and riparian condition and that grazing management strategies have to be adjusted based on the sensitivity of the various streams in a watershed (Rosgen 1993).

Waterfowl and shorebirds residing in wetland habitats would benefit from improved wetlands meeting proper functioning condition objectives. The riparian and wetland habitats meeting these objectives would receive less sediment which would encourage aquatic macroinvertebrate production and plant growth. This would result in more food for these birds and better shoreline and emergent vegetation cover for nesting, brood rearing, migration, and feeding activities. Since these habitats are quick to respond to changes in grazing management, the improvements are expected in both the short term and long term periods.

#### **4.2.4.2 Big Game**

The implementation of the standards and guidelines would promote the ecological functions and processes that favor healthy and sustainable big game habitats. Where the standards are not being met, livestock grazing management would consider how the timing and intensity of grazing use could be changed to maintain a specific plant community or desired successional changes. The use of grazing to manipulate habitat for big game represents an effective and ecologically sound management tool (Schmidt and Gilbert 1978).

## **Mule deer**

It has been recognized for several decades that livestock grazing has played an important role in the creation and maintenance of shrub communities that support mule deer in the western states (Schmidt and Gilbert 1978; Walmo 1981). Longhurst (1981) stated that the cumulative impact of long-term livestock use is likely the paramount influence which has produced and maintained seral vegetation for deer. This is especially true in the Great Basin where sagebrush and other successional shrub species dominate areas that were more interspersed with perennial grasses under pristine conditions. Recent invasions of cheatgrass (*Bromus tectorum*) and medusahead (*Taeniatherum caput-medusae*) have altered both the forage composition and the influence of fire in these communities by providing a fine fuel cover that increases fire frequency and intensity and eliminates shrubs and other herbaceous plants. Livestock grazing may be an important tool to manage these fine fuels through prescribed grazing that would be implemented through the standards and guidelines. Where objectives include maintaining the shrub component of vegetation, the maintenance of diverse shrub and forb species in the plant communities under the proposed standards would help improve and maintain forage quality on mule deer ranges.

In many of the pinyon-juniper habitats in eastern California, there has been an increase in the density of these tree species with a decrease in the shrub and grass/forb vegetation layers. While the increase in the tree species is an improvement in mule deer cover (Longhurst et al. 1981), a closed pinyon-juniper stand with a sterile understory is a loss of palatable mule deer forage and is considered degraded mule deer habitat. Livestock grazing may accelerate this increase in pinyon and juniper but can be also be used as a management tool, along with fire management, to reduce the cover and reproduction of these tree species and maintain the shrub seral stages (Schmidt and Gilbert 1978). Implementation of the rangeland health standards would improve mule deer habitat where herbaceous and shrub species replace dense pinyon-juniper stands due to changes in grazing and fire management.

On California's annual ranges, the composition of introduced annual vegetation has increased carrying capacity for mule deer; and continued livestock grazing at moderate intensity is necessary to maintain high carrying capacity for deer (Longhurst 1981). The standards and guidelines for the annual ranges promote both the composition of these annual species and the maintenance and diversity of native vegetation (especially oak species) that will benefit mule deer.

The proposed standards and guidelines would place an emphasis on the function and condition of riparian habitats. This would be of benefit to mule deer populations that depend on these riparian habitats for forage, cover and fawning habitat (Longhurst 1981). Livestock grazing practices would be designed and implemented to meet the standards for proper functioning condition and diverse composition and structure of riparian habitats. This would promote a more complex riparian community that would benefit mule deer habitat quality.

The interaction of livestock grazing, fire, and mule deer use on plant community production, composition, succession, and ecological processes would be key discussion points in developing management objectives on grazed allotments. Mule deer habitats are expected to be maintained or improved as a result of such discussions.

## **Elk**

The proposed standards and guidelines would improve or maintain elk habitats on BLM upland and riparian habitats. The increase in plant cover and native plant diversity would favor later seral stages and grass production that are important for elk. Livestock grazing practices that increase and maintain the grass component of rangelands would favor elk habitat over mule deer (Schmidt and Gilbert 1978). The maintenance of residual dry matter on annual ranges would also favor taller grass species over forbs, and this would also be beneficial to elk. However, since elk populations are not limited by forage availability or current habitat conditions, populations would meet management objectives and continue to be regulated by Department of Fish and Game management strategies.

## **Pronghorn**

The implementation of the standards and guidelines would benefit pronghorn populations on BLM lands by promoting ecological functions and processes that create and maintain diverse plant communities. Pronghorn thrive best on ranges with a diversity of grass-forb-shrub habitat types, but are widely adaptable to different forage conditions (Clary and Holmgren 1981). The most favorable pronghorn habitats are characterized as those with 50% living vegetation, a mix of grass, forbs and shrubs, a variety of grass, forb and shrub species, succulent forbs, a variety of vegetative communities, and relatively low vegetative height (Schmidt and Gilbert 1978). Many of these attributes are considered in the standards (and indicators) and are expected to be promoted in the implementation and evaluation of grazing management. Little change would be expected on the upland habitat sites in the short term, but an improvement of vegetation composition and structure for pronghorn would occur over the long term as plant communities become more diverse with native plant species. A more rapid improvement of riparian habitats used by pronghorn (grass meadows) is expected. The improvement of these habitats would be considered as high priorities in the application of the standards and guidelines to meet management objectives.

In some areas, it has been concluded that livestock-pronghorn interactions affect pronghorn habitat use during the winter season (Clary and Holmgren 1981) or fawning season (McNay and O'Gara 1981). In such cases where the standards are not being met to support native species, grazing management practices could be altered within the guidelines to meet management objectives that would improve pronghorn reproduction.

### **4.2.4.3 Upland Game**

The most noticeable changes to upland game habitats would be in the improvement of riparian habitats that provide important food, cover and water for these bird and mammal species. While changes are not expected in the short term in the upland vegetation types, rapid improvement of riparian habitats is expected where grazing management is altered to meet rangeland health objectives. In the long term, the upland habitats are expected to

improve to a minor degree as vegetation cover and diversity increases. The increase in wildfire activity in the upland plant communities will help promote this diversity.

#### **4.2.4.4 Fisheries**

The number of miles of streams and acres of wetlands meeting proper functioning condition criteria would increase with the implementation of the standards and guidelines, thus improving aquatic habitats. The amount of sediment would be reduced, streambank structure would be improved to provide overhanging vegetation and banks, and stream shading would increase. In many cases, the stream channel would narrow and deepen, pool development would accelerate, and streambanks would stabilize. Increased vegetation cover and structure would reduce summer stream and inter-gravel water temperatures which would increase dissolved oxygen levels, thus increasing stream biological activity (Platts 1990). The biomass of fish would increase as aquatic habitat conditions improve.

Platts (1990) reviewed a broad variety of livestock grazing practices and how successful they can be in meeting wildlife and fisheries habitat objectives. He states that "consideration of streamside zones in the development of grazing strategies provides the best opportunity for the development of compatible grazing strategies." Many of his criteria for success are included in the proposed riparian standards and indicators. Thus, the proposed standards and guidelines provide an opportunity to develop appropriate grazing practices to meet proper functioning condition and improved riparian habitat conditions, where needed, to meet fisheries habitat objectives.

#### **4.2.5 SPECIAL STATUS SPECIES**

##### **Special Status Plant Species**

Determinations concerning the effects of livestock grazing on special status plant species were made by Field Office botanists or other specialists with special status plant program responsibilities. They based these determinations on a variety of sources, including research, monitoring, professional judgement, and consultation with other sources, including the California Natural Diversity Data Base. The effects of livestock grazing given in Appendix 11 apply only to the effects on BLM lands, not to the effects grazing may have on lands of other ownership.

Twenty-four of the 159 special status plants known to occur within the project area are negatively impacted by current grazing management practices (Appendix 11), although for several of these species the impacts occur only in a small portion of their ranges.

The measures that will be taken to remove the grazing impacts to these species will be developed on a site-specific basis by individual Field Offices. The types of actions that will be taken may include one or more of the following: reductions in stocking rate, changes in season of use, protection by fencing, or redistribution of livestock away from special status plant populations (by herding or locating mineral blocks and water sources well away from the populations). If none of these actions works or is infeasible, livestock grazing may be eliminated entirely from the allotment or pasture containing the species.

The following species would be expected to respond positively to changes in grazing management under all five alternatives:

Geyer's milk-vetch (*Astragalus geyeri* var. *geyeri*)  
Long Valley milk-vetch (*Astragalus johannis-howellii*)  
Mono milk-vetch (*Astragalus monoensis* var. *monoensis*)  
Tonopah milk-vetch (*Astragalus pseudiodanthus*)  
Inyo mariposa (*Calochortus excavatus*)  
Alkali mariposa lily (*Calochortus striatus*)  
Shirley Meadows star-tulip (*Calochortus westonii*)  
San Benito evening-primrose (*Camissonia benitensis*)  
Red Hills soaproot (*Chlorogalum grandiflorum*)  
Mariposa clarkia (*Clarkia biloba* ssp. *australis*)  
Crosby's buckwheat (*Eriogonum crosbyae*)  
Temblor buckwheat (*Eriogonum temblorense*)  
Boggs Lake hedge-hyssop (*Gratiola heterosepala*)  
Sierra Valley ivesia (*Ivesia aperta* va. *aperta*)  
Alkali ivesia (*Ivesia kingii* var. *kingii*)  
Pale-yellow layia (*Layia heterotricha*)  
San Joaquin woolly threads (*Lembertia congdonii*)  
Panoche pepper-grass (*Lepidium jaredii* ssp. *album*)  
Sagebrush loeflingia (*Loeflingia squarrosa* var. *artemisiarum*)  
Congdon's lomatium (*Lomatium congdonii*)  
Mono Lake lupine (*Lupinus duranii*)  
Kelso Creek monkeyflower (*Mimulus shevockii*)  
Mono County phacelia (*Phacelia monoensis*)  
Sequoia gooseberry (*Ribes tulareense*)

These positive changes would likely be realized faster under Alternative 4 than under the other four alternatives.

Six special status plant species that are in grazing allotments may be negatively impacted by current grazing management practices, but not enough is presently known about grazing effects upon these species to make this determination. These species are:

Walker Pass milk-vetch (*Astragalus ertterae*)  
Beaked clarkia (*Clarkia rostrata*)  
Piute cypress (*Cupressus arizonica* ssp. *nevadensis*)  
Recurved larkspur (*Delphinium recurvatum*)  
Munz's tidy-tips (*Layia munzii*)  
Piute Mountains navarretia (*Navarretia setiloba*)

Information to help determine how grazing affects these species will be collected through inventory and monitoring efforts under all five alternatives. However, this would be expected to be accomplished faster under Alternative 4. If this information indicates that livestock grazing is negatively impacting any of these plants, the management changes that followed this determination would be expected to positively affect these species.

### **Special Status Animal Species**

The effects of livestock grazing are quite variable among the listed species. Appendix 12 identifies the state and federally listed species on BLM lands in California and indicates whether livestock grazing is considered a compatible management practice.

The proposed standards and guidelines would promote the ecological function and processes necessary to maintain and improve listed species habitats on BLM lands. Since listed species would be considered in meeting rangeland health standards, livestock grazing practices would be designed to promote the conservation and recovery of these species. Where existing livestock grazing is not compatible with listed species conservation, the guidelines include appropriate actions to avoid impacts or design compatible grazing prescriptions (seasonal restrictions, adjusted stocking rates, utilization levels, or exclusion). Where such circumstances exist, site-specific measures would be developed to meet conservation goals and those that require specific grazing practices would be included as terms and conditions in the grazing permits.

#### **4.2.6 WILD HORSES and BURROS**

The following assumptions, taken from the Rangeland Reform '94 EIS (BLM 1994), were also used in the impact analysis for this EIS.

- Standards and guidelines for managing domestic livestock grazing do not apply directly to managing wild horses and burros.
- Appropriate management levels (AMLs) would be established or changed mainly as a result of site-specific monitoring when dealing with a site-specific issue. For the analysis in the EIS, AMLs would remain constant throughout all alternatives.
- The issue of wild horse and burro overgrazing is not within the scope of this EIS.
- Wild horse and burro populations would be at appropriate management levels within the short term under all alternatives.

#### **Impacts to Wild Horses and Burros**

Generally, where livestock grazing is the causative factor for failing to conform with the standards, implementation of the guidelines for livestock grazing will promote progress towards achieving or maintaining healthy soils, functioning riparian areas, proper stream morphology, healthy, productive and diverse native species and clean water. And, as stated in the Rangeland Reform '94 EIS, improved upland and riparian vegetation would result in improved habitat conditions for wild horses and burros where livestock competition has been reduced (BLM 1994).

Impacts to wild horses and burros from implementing the standards and guidelines fall into four categories:

- (1) General positive impacts to wild horse and burro populations resulting from improved rangeland health (as mentioned above);

- (2) Increased potential for gather and removal disturbance of wild horse and burro populations as a result of (1), above;
- (3) Localized potential negative and positive impacts to populations of wild horses and burros resulting from some livestock management actions made by BLM to reach conformance with rangeland health standards; and,
- (4) Increased potential for gather and removal disturbance of wild horse and burro populations, if the gather and removal is determined to be an "appropriate action" if and when it is found that wild horse and burro use is a significant factor preventing conformance with a standard(s) for rangeland health.

Improved rangeland health would positively impact wild horses and burros by providing them with higher quality habitat. This in turn would result in slight improvements in conception, carrying through term, foal survival and longevity. Therefore, we would expect increases in natality, recruitment, and survival, and decreases in mortality.

Wild horse and burro populations would grow more rapidly and, assuming that the AML remains unchanged, be disturbed more frequently by the gather and removal operations needed to maintain the Appropriate Management Level (AML). It is also possible that, over the long term, improved rangeland health would provide a higher level of sustained and reliable forage production, that would result in a determination to increase the Appropriate Management Level for a particular Herd Management Area.

Livestock management actions taken to improve rangeland health would potentially have both positive and negative localized impacts to populations of wild horses and burros. Negative impacts on their free-roaming nature could result if it is determined, for example, that "the appropriate action" is to construct fence(s) to allow for improved livestock management in riparian or upland areas. Such potential impacts should be recognized in the site-specific environmental analysis conducted for such projects and be avoided or mitigated.

Localized positive impacts to wild horses and burros could result from water developments constructed in wild horse and burro Herd Management Areas to allow livestock to graze areas now unused or infrequently used by them, if this is determined to be, or be a part of, "the appropriate action." Where these water developments are located in Herd Management Areas, it is expected that wild horses and burros also will use them.

Cattle and wild horses have significant dietary overlap during all seasons of the year, especially in dry years and during the season when vegetation is dormant (Nat. Acad. Sci. 1980). Some studies, however, have noted very little contemporaneous spatial overlap between horses and cattle (Nat. Acad. Sci. 1980). Yet, BLM field personnel have noted that horses graze in areas both before and after livestock have used the area. For this reason, it is very difficult to quantify and separate impacts of wild horses from those of cattle without concerted, focused study.

However, we do know that there are allotments where use by wild horses and burros is a significant factor contributing to rangelands not conforming with a standard. Depending upon the "total picture" of uses and reasons the land is not conforming with the standard, localized gathers may be initiated where rangeland health standards are not being met and wild horse and/or burro use is the causative factor.



Presently there are no "guidelines for wild horse and burro grazing" although this use, as well as other public land uses, does and will continue to affect the attainment of the standards for rangeland health.

Should wild horse and burro grazing be found to be a causative factor for failing to meet one or more rangeland health standards, the manipulation of wild horse and burro distribution, period or season-of-use within a Herd Management Area currently is not, and is not expected to become, a tool available to the rangeland manager to ensure attainment of the standard. Controlling populations has been and will continue to be the only tool available.

This becomes pertinent in cases where a guideline requires livestock to be moved from a riparian area following early spring use to allow for riparian regrowth during the late spring and summer. In some cases, wild horses and burros will either remain or move into the area and graze it heavily, which could lead to a failure to attain the standard. Should this result in the removal of the wild horses and burros? A similar example is where livestock use is restricted to dormant season use in salt-desert half-shrub ranges, which decline in condition when the vegetation is not dormant or from heavy use at any time of year (Blaisdell and Holmgren 1984). Wild horses and burros cannot be similarly seasonally restricted and may contribute to condition decline in these ranges. Should they then be removed? Scientists recognize this conundrum. In a subsection of Chapter 3 of *Wild and Free Roaming Horses and Burros: Current Knowledge and Recommended Research* entitled "Range-Plant-Community Impacts," which discusses the responses of plant communities to grazing use, it is stated :

The implications of these studies for the management of wild horse ranges are clear. If maintenance of a stable range condition is a desired management objective, control of grazing season may be equally as important as control of animal numbers. This type of control may prove particularly difficult in some areas where options are limited [in the manager's legal authority] to regulating movement patterns and distribution of animals over the range" (Nat. Acad. Sci. 1980).

These types of questions are not covered by the grazing regulations, but create very real concerns about our ability to successfully implement rangeland health standards and guidelines in some areas.

## **4.2.7 RECREATION**

Recreational use of the public lands will continue to grow, with or without implementing rangeland health standards, due to the increasing population pressures within the State, and the marketing of California as a vacation destination.

Implementation of the rangeland health standards and guidelines would have some positive affects upon recreational use of the public lands due to the improved ecological function of those lands, and therefore, the increased recreational opportunities, and the improved aesthetic value of the landscape. These positive affects would be realized under all alternatives, but would likely occur a bit faster under Alternative 4 due to the faster implementation schedule. There would not be a noticeable difference in the rate of increase of recreational use under the different alternatives.

Recreational activities will continue to contribute to environmental degradation, and this would increase in some areas due to increased use. Specific examples are OHV use (including access by hunters and fishermen, not just motorcycles, etc.) and trampling of riparian vegetation by campers and fishermen. Application of the standards of rangeland health, and a set of guidelines, to recreational use would help prevent some of the impacts caused by recreation.

#### **4.2.8 WILDERNESS**

Implementation of the Rangeland Health Standards and Guidelines would have both positive and negative affects on wilderness and Wilderness Study Areas (WSAs). The benefits of the standards to the wilderness program will slightly outweigh the negative aspects.

The most substantial benefit would be the improvement of a healthy and naturally functioning ecosystem. Maintaining or improving wildlife habitats through the reduction of livestock and/or through a management system which reduces livestock impacts would allow the area to appear or actually be more natural. Implementation of standards and guidelines would also reduce potential long term management conflicts between the livestock program and the wilderness management program.

The negative aspects to the wilderness program from implementing the Standards and Guidelines would come from the increasing human manipulation of natural systems to resolve past livestock impacts. For example, building additional livestock developments such as water structures and fences increases the number of man-made facilities in the wilderness or WSA. These developments would require the occasional use of motorized or mechanized equipment for maintenance. Both the developments and use of equipment reduce the naturalness of the area and the opportunities for solitude away from human intrusions. Vegetative treatments (e.g., seeding, prescribed fires, ripping) to restore natural vegetation would create temporary visual impacts to the wilderness experience.

The difference in the degree of impact between the alternatives is minor. Even though Alternative Four projects more range developments, the numbers of livestock and the number of acres grazed are potentially reduced. The addition of more developments and the associated long term maintenance needs may create a slightly greater impact to the wilderness or WSAs than the other alternatives, but the improvement of the wilderness ecosystem would likely be more rapid.

#### **4.2.9 CULTURAL RESOURCES**

Overall, implementation of the proposed standards or any of the alternatives would have little direct affect upon cultural resources.

##### **Cultural Properties**

Reducing cattle numbers and restricting them from riparian and wetland areas (which have the highest cultural site densities) would help protect some sites from damage through trampling or continued erosion. Alternatively, development of more range improvement projects, and fences with the usual development of trails along those fences, would undoubtedly damage

some sites -- although this loss would be lessened or mitigated through the Section 106 process by locating fences and other developments away from sites, and recording the sites and determining National Register eligibility before any projects are constructed.

## **Traditional Lifeway Values**

### **Native Americans**

Most traditional Native American uses of the public lands would not be affected by implementation of the standards and guidelines. However, implementation will result in improvements to upland, riparian, and wetland resources over the long term. If management goals for the vegetative resources are developed in consultation with Native American groups, as outlined in BLM Manual 8161, then there would be some positive benefits through enhancement or encouraged growth of plants traditionally collected for subsistence, medicinal purposes, or crafts.

### **Ranching Communities**

To most ranchers, there will be no impacts to their traditional ranching lifeway through implementation of the grazing standards. In some of the small ranching communities, as explained in the following economic analysis sections, there would be some short term adverse economic impacts to some ranching operations where changes would be made in grazing management to allow the allotments to meet the new standards. In the case of economically marginal operations, this would mean that a rancher might go out of business and give up his traditional lifestyle; or he might join the increasing number of those who have non-ranching jobs to provide a stable income, and ranch part-time, thus continuing his traditional lifestyle to some extent. Whether a person chooses one or the other alternative is dependent upon the availability of jobs in the area, the individual's knowledge and skills, and individual inclination.

Over the long term, improved rangeland health would give greater economic stability to many ranchers, thus enabling them to continue their traditional lifeways. As an example, riparian areas must be healthy and properly functioning to produce water for livestock, domestic use, or fish habitat, and to produce forage for livestock or wildlife. If an area is not healthy, it will not fully support anyone's desired uses or management objectives. However, as areas become more healthy, they can support more uses, and provide greater benefits for the long term.

Of more importance to continuation of the traditional ranching lifeway, and a much greater threat, are the continued pressures of people seeking out the small communities for recreational activities and "country living." The pressures of other uses on the land, as well as the influx of people with different values, and the opportunities for converting rangeland into housing developments is changing the traditional ranching cultures in many communities, and will continue to do so during the next century.

## **4.3 DIFFERENCES BETWEEN ALTERNATIVES**

### **4.3.1 GRAZING MANAGEMENT**

#### **4.3.1.1 Alternative 1, original RAC Recommendations**

Implementation of the RAC recommendations would occur on a priority basis as described in Chapter 2 and within BLM's current staffing and funding levels, with full implementation predicted to be completed within 15 years. The actual improvement or recovery would extend beyond that timeframe in some areas, depending upon climate, topography, and physical potential of the site.

Of the 459 allotments assessed in the EIS area, 59 of these allotments do not meet one or more of the standards due to current or recent grazing practices. Most would require changes in livestock grazing management or grazing related activities; however, changes have already been implemented on some of these allotments. Note that since the preparation of the draft EIS, a more refined assessment has been made of the allotments in relation to meeting the fundamentals of rangeland health. Evaluations are currently underway to determine the specific changes in management required for each allotment to meet the fallback standards as identified for Alternative 3. This information is not yet available for this assessment. The management changes projected in the draft EIS were based on broad assumptions from past experiences by the field offices and were not based on specific needs as determined through detailed evaluations. Since detailed information is currently not available to use for analysis, the same projected information from the draft EIS will be used for this analysis, except the numbers will be 28% less, based upon the proportional decrease (28%) in the number of allotments now determined to need management changes (see Chapter 3, Section 3.2.1).

Thirty five of the 59 allotments requiring change are located within the Great Basin Floristic Province and contain a relatively large acreage of public rangeland. The allotments requiring change in the annual grassland area typically have less public land and would require comparatively fewer adjustments (such as an adjustment in utilization level or season of use).

Adjustments in the amount of grazing use (through changes in utilization levels, season of use, exclusion, etc.) would result in a reduction of 11,712 AUMS within 1-5 years, and extending through a good portion of the implementation period. Some sustainable grazing capacity is predicted to recover as vegetative conditions improve, with a corresponding reinstatement of some AUMs. As a result of the management changes, there may also be an increase in potential sustainable grazing capacity above current levels of authorized grazing use on some allotments. Actual determinations of how many AUMs would be reinstated or additional AUMs authorized as a result of improvement would be determined through the monitoring of rangeland health conditions. Portions of some of the grazing allotments that are currently grazed could be excluded from grazing use entirely or at least until rangeland health conditions in those areas are fully restored.

Changes in grazing systems would vary relative to the particular need for restoring rangeland health on a particular allotment. These systems may include prescriptive systems based on calendar dates or based upon vegetative conditions, such as range readiness, utilization levels, plant growth conditions, etc. Rotating grazing at different times or seasons on specific areas within an allotment is often effective. For some allotments, a minor modification of the existing grazing system may be all that is necessary.

Changes in the current season of use that an allotment or a portion of an allotment is grazed may be needed to help rangeland health recovery. Proposed changes in class of livestock, most involving changing the use from cattle to sheep, would better enhance the recovery of riparian areas or areas where managing the current class of livestock to meet rangeland health goals is not achievable.

Herding livestock, particularly in allotments with areas sensitive to grazing, such as riparian areas or habitats of endangered species, is considered to be a viable management measure for 26 allotments. It is predicted that this may require up to 89 additional workmonth equivalents in labor for the permittees or lessees.

<b>Table 4.3.1: ESTIMATED MANAGEMENT CHANGES -- PROPOSED ACTION</b>	
<b>No. of Allot.*</b>	<b>Type of Change</b>
34	Reductions in livestock use -- within 1-5 years, extending until recovery or improvement
25	Areas excluded from livestock use <sup>1</sup>
24	Changes in grazing system
19	Changes in season of use
8	Changes in class of livestock
27	Livestock herding needed
35	Water developments needed
36	Fencing needed
23	Vegetative treatments needed
16	Weed control needed

\* Many of the allotments may require more than one type of change.

(1) Some areas within some of the existing allotments may no longer be available for grazing, but not the entire allotment would be excluded.

In order to successfully implement many of the necessary management changes, as well as to further facilitate the enhancement of the health of vegetative communities, the range improvement projects identified in Table 4.3.1 and Table 4.3.1(a) will need to be in place and/or implemented at an estimated cost of over \$1.5 million.

<b>TABLE 4.3.1(a): ESTIMATED AMOUNT and COSTS of RANGE IMPROVEMENT PROJECTS</b>	
<b>Amount and Type of Activity</b>	<b>Costs</b>
8,000 acres of vegetative treatment	\$ 424,000
5,000 acres of weed control	286,000
127 livestock watering facilities	322,000
178 miles of fencing	534,000
<b>Total</b>	<b>\$ 1,566,000</b>

Vegetative treatment projects would convert existing vegetative communities to a more desirable type generally through the use of prescribed fire, mechanical removal, and/or reseeding. Weed control would be done using an integrated management approach which could include the use of herbicides, mechanical removal, prescribed burning, or the use of biological control agents. The additional watering facilities and fencing would help re-distribute livestock use from existing heavily used areas or to help control livestock grazing use within specific areas or during specific seasons.

#### **4.3.1.2 Alternative 2 -- State-wide Consistency/Consolidated Standards and Guidelines**

The impacts of this alternative are the same as for Alternative 1.

#### **4.3.1.3 Alternative 3 -- No Action (Fall-Back Standards and Guidelines)**

The impacts of this alternative are the same as for the proposed action alternative, Alternative 1, given the following assumption.

The Fallback Guidelines numbers 7, 9, 11 and 12 raise some questions of original intent and consistency with the other alternatives. This becomes particularly critical when considering the future management of California's annual grasslands. It is assumed for the purposes of this analysis that fallback Guideline Number 15 was designed to provide an exception to the above guidelines for designated annual grassland in California as well as designated ephemeral rangelands which are common in desert areas outside of the EIS area. The key concerns regard the enhancement and management of native species and the concern for season-long grazing. Guideline 15 then provides for sustaining healthy rangeland conditions within the management parameters identified for these type of rangelands.

#### **4.3.1.4 Alternative 4 -- Rapid Improvement/Rapid Recovery Alternative**

Under this alternative implementation would occur on a priority basis as described in Chapter 2; however, the rate of implementation would be accelerated beyond that of the other alternatives and beyond the capability of BLM's current staffing and funding levels. Most of the needed changes would be fully implemented within 5 years. Also, because of the need to enhance rangeland health conditions at this accelerated pace, some management changes

would be applied differently and with a less incremental approach than might be done for the other alternatives.

Adjustments in the amount of grazing use would result in a reduction of 25,849 AUMS within 1-5 years. This increase in loss of AUMs over the other alternatives is a result of implementing more restrictive utilization levels, excluding more areas from grazing use, and implementing other measures that would accelerate rangeland health recovery much faster than the other alternatives. Portions of allotments, consisting of a total of 67,869 acres, would be excluded from grazing use.

The types of changes in grazing management measures would be the same as for those in the proposed action, but the frequency at which the actions would be applied would increase and there would be an increase in the number and types of actions implemented on some allotments. The increase in the rate of application and intensity of management would be necessary in order to restore rangeland health in this accelerated time-frame. As compared to the proposed action alternative, adjustments in the amount of livestock use would affect 11 additional allotments for short term reductions. There would be an additional 58,000 acres of areas excluded from grazing, at least on a temporary basis. Compared to the other alternatives, grazing management changes would be applied to an additional number of allotments as follows: grazing systems for 10 allotments, changes in season of use for 12 allotments and 7 more allotments would require herding techniques requiring an estimated total of 160 workmonth equivalents of labor to conduct the herding. There would be no change in the number of allotments needing a change in class of livestock. The increase in the numbers of allotments affected is primarily due to allotments where some actions have already been implemented and improvements are occurring (no need for action under Alternatives 1, 2, 3 and 5), but different actions would be applied under this alternative to result in more rapid improvement or recovery.

<b>Table 4.3.1(b): ESTIMATED MANAGEMENT CHANGES -- ALTERNATIVE 4</b>	
<b>No. of Allot.*</b>	<b>Type of Change</b>
45	Reductions in livestock use -- within 5 years, extending until recovery or improvement
27	Areas excluded from livestock use <sup>1</sup>
44	Changes in grazing system
31	Changes in season of use
8	Changes in class of livestock
34	Livestock herding needed
23	Water developments needed
38	Fencing needed
23	Vegetative treatments needed
19	Weed control needed

\* Many of the allotments may require more than one type of change.

(1) Areas within existing allotments would no longer be available for grazing, but not the entire allotment would be excluded.

The types of range improvement projects, as identified in Table 4.3.1(b) and Table 4.3.1(c), needed to facilitate the accelerated rate of improvement of vegetative conditions are the same as for the proposed action, however the amount of additional projects and areas affected would be greater resulting in an additional 16,000 acres of vegetative treatment, 2,200 acres of weed control, 17 more watering facilities, while the total miles of fencing needed is almost the same. The total costs predicted for implementing the projects would be approximately \$1 million more than for the proposed action.

<b>TABLE 4.3.1(c): ESTIMATED AMOUNT and COSTS of RANGE IMPROVEMENT PROJECTS</b>	
<b>Amount and Type of Activity</b>	<b>Costs</b>
24,000 acres of vegetative treatment	\$ 1,272,000
7,200 acres of weed control	410,000
144 livestock watering facilities	365,000
180 miles of fencing	540,000
<b>Total</b>	<b>\$ 2,587,000</b>

In order to implement the needed management actions for this alternative, additional BLM staffing and funding would be required to meet the time frame objectives. As this alternative requires greatly accelerating assessments, evaluations, management determinations and range improvement projects, an estimated increase of 18 full-time equivalent personal with an additional \$180,000 per year for operating expenses over current levels for implementation would be required. These additional costs would be required for the first five years of implementation; thereafter a return to current levels of staffing for ongoing monitoring and administration may be appropriate.

Some sustainable grazing capacity is predicted to recover as vegetative conditions improve, with a corresponding reinstatement of some AUMs. As a result of the management changes, there may also be an increase in potential sustainable grazing capacity above current levels of authorized grazing use on some allotments. Actual determinations of how many AUMs would be reinstated or additional AUMs authorized or exclosures opened, and where and when this would occur, have not been made, and would depend upon the actual on-the-ground improvements in rangeland health following implementation of management changes. These changes are expected to occur much more rapidly under this alternative than under Alternatives 1, 2, 3 and 5.

#### **4.3.1.5 Alternative 5 -- Preferred Alternative**

The major differences between the preferred alternative and the other alternatives focus on water quality and grazing utilization levels. This alternative provides consistent standards and guidelines for the three RAC areas for water quality and references to the application of the proposed best management practices (BMPs) identified in Appendices 9 and 10. Adherence to meeting the water quality standards and applying the guidelines, including the BMPs, should not result in any difference in consequences between the alternatives to grazing operations. Adherence in meeting state water quality standards and using approved BMPs is a policy requirement with or without its identity in the developed rangeland health standards and guidelines, and would therefore be applied regardless. The consequences of



implementing this alternative, therefore, would be no different than implementing any of the alternatives regarding water quality protection.

Specific grazing utilization level guidelines were added or modified in this alternative to each of the three RAC's set of guidelines. Except for Alternative 3, which is silent regarding specific utilization levels, the modified language of the utilization guidelines in this alternative will result in little or no change in implementation for the Bakersfield RAC area, since the criteria in the guideline are essentially the same. For the Ukiah RAC area, the guideline would add maximum utilization levels for perennial ranges. At the present time, however, there are no allotments within the Ukiah RAC area currently requiring perennial range management objectives. Additionally, the guidelines add specific utilization levels for riparian areas in the Ukiah RAC area and browse limits for both RAC areas, but any impacts from these added requirements to current grazing use are unknown at this time. For both of these RAC areas, the modifications mainly serve to further explain the application of use levels. The guideline also provides consistency for all annual grassland ranges regarding residual dry matter (RDM) levels throughout the EIS area.

This alternative abolishes Guideline 14 for the Susanville RAC area (still in Alternatives 1 and 2), and replaces it with the above discussed guideline for utilization levels. Guideline 14 in Alternatives 1 and 2, although more liberal on use levels for perennial herbaceous vegetation, would be applicable to all allotments until site specific use levels could be determined on an allotment-by-allotment basis. This would require the immediate application of utilization standards and guidelines for all allotments upon approval of the standards and guidelines. The replacement guideline (Susanville Guideline 16) in Alternative 5 requires the utilization levels to be applicable only in cases where one or more standards is not being met, where significant progress is not being made toward meeting the standards, where livestock grazing is the cause, and where use of the utilization guidelines would be expected to enable the area to meet the standards. Although the adjusted maximum utilization levels that may be applied to allotments (or parts thereof) are quite conservative in comparison to Guideline No. 14 in Alternative 1 and 2 (25-40% in Alternative 5 compared to 50-60% in Alternatives 1 and 2), the number of allotments anticipated to be affected by this modified guideline is substantially lower. For example, there are 22 allotments currently needing management changes in order to meet one or more of the fundamentals of rangeland health in the Susanville RAC area that would be subject to this guideline. It is anticipated that the current utilization levels for some of these allotments, however, may not trigger the need to apply this guideline at all, while in other allotments the application will be limited to only certain key areas. Most utilization adjustments that are applied could be accomplished through management changes such as season of use, fencing, herding, and other practices, including AUM adjustments.

The consequences of this alternative, other than discussed above, would be the same as Alternative 1.

## **4.3.2 UPLANDS**

### **4.3.2.1 Soils**

The major difference between the alternatives is that under Alternative 1, the Standards and Guidelines developed for the Susanville RAC area do not address plant litter. Under this alternative the measure chosen to gauge soil health is erosion. Erosion is a symptom of a

system out of equilibrium, often due to a change in natural soil cover, soil intake rates (compaction) or the natural drainage pattern (roads). A change in soil cover resulting from fire or grazing may leave the soil unprotected from natural erosive forces of wind or water. In this example, erosion is the symptom and the cause is reduced soil cover. If management monitors erosion, then damage to the resources has already occurred; however, if the potential cause of the resource degradation is monitored and managed before damage occurs, then prevention is possible.

This oversight has been corrected in Alternative 5 by addressing litter in the soil standard for the Susanville RAC area.

### **4.3.3 RIPARIAN-WETLANDS and STREAM CHANNELS**

#### **4.3.3.1 Water Quality**

Under all alternatives, as explained in Section 4.2.3.3, we would see a general enhancement and improvement in riparian and wetland conditions. This improvement would be reflected in hydrologic function and water quality. This would be a similar improvement under all alternatives, but potentially more rapidly under Alternative 4.

Managing for the enhancement of water quality and meeting State water quality standards are a matter of BLM policy, as well as being mandated by the Clean Water Act and other authorities. BLM will comply with the direction in the regulations regardless of how they are identified in the standards and guidelines.

Although the standards and many of the guidelines either address or are supportive of enhancing water quality, there are some differences between the alternatives as well as some deficiencies that could result in BLM missing opportunities to improve water quality in some cases. An evaluation of the adequacy of the Standards and Guidelines in addressing water quality concerns is contained in Appendix 16. The potential impacts of those differences is discussed below.

#### **Alternative 1**

The Bakersfield and Ukiah RACs specifically address meeting state water quality standards. However, the Ukiah water quality standard provides for an exception to meeting state standards for off-stream artificial impoundments. This is contrary to the State's requirements and therefore cannot be implemented by BLM. The Susanville standard and description does not address meeting state standards, and focuses instead on meeting "desired" beneficial uses.

While some of the guidelines specifically address water quality concerns or support management measures that indirectly protect water quality, lack of some more specific guidelines such as hardening water gaps or water crossings, and measures minimizing livestock concentrations in riparian areas could result in overlooking opportunities to improve water quality.

#### **Alternative 2**

This standard does not address meeting state water quality standards; rather, it focuses on working with the State of California and the Regional Boards to revisit the Basin Plans and make new determinations of the beneficial uses. The intent is that BLM and the State of California would jointly determine what the new standards would be.

As the guidelines for this alternative are the same as for Alternative 1, the potential impacts would be the same.

### **Alternative 3**

Neither the standards or guidelines specifically address water quality. The fallback standards, by not including water quality, are inconsistent with the requirements of the regulations and the identified fundamentals of rangeland health.

Some of the fallback guidelines do support protection of water quality values as identified for other purposes (Guidelines 3, 4, 12 and 13). Again, there is some risk that if guidelines do not specifically provide for grazing management actions that enhance water quality, then some impacts would occur due to oversight.

### **Alternative 4**

The standard in this alternative specifically states that BLM will meet state water quality requirements. There is a specific guideline that states that when making management changes or adjustments, we would do them in a manner that would maintain or enhance water quality to meet identified management objectives. Guideline 1 also uses specific examples of management practices that could maintain or enhance water quality. However, there are no specific guidelines for minimizing livestock concentration at or near water sources, thereby increasing the possibility that opportunities to improve water quality would be overlooked.

### **Alternative 5**

The preferred alternative provides consistent language in the standards and guidelines, referring to meeting the standards of both states (appropriate to the specific RAC area) and referencing a set of proposed best management practices (BMPs) for grazing. Additionally this alternative clears up some confusion identified in some of the other alternatives regarding meeting drinking water standards at livestock watering facilities. This alternative provides improved consistency and clarity over the other alternatives and provides adequate emphasis for the protection of water quality from livestock grazing activities.

The proposed Grazing Management Practices for Water Quality and BMPs in Appendices 9 and 10 provide a list of types of management measures and prescriptions to include for protecting water sources and water bodies from nonpoint sources of pollution that may occur from livestock grazing activities. Most of the practices are either consistent with or a refinement of the standards and guidelines provided in Alternative 5 or the other alternatives. Included are some management measures that are not directly applicable to authorized livestock grazing use such as the management of wild horses and burros and the installation of holding facilities. However, these inclusions would logically be placed with the grazing element in the overall water quality management plan which is to include BMPs for all public land activities. The prioritization of water quality management objectives for application in California (Appendix 10) is consistent with BLM policy.

#### **4.3.4 ECONOMICS**

The economic impact analysis is based on assessments by the 10 California BLM Field Offices of how implementation of the Standards and Guidelines would affect their rangeland management program. Central to their assessment is how livestock AUM levels might be affected and potential changes in permittee operation expenses. The following economic analysis is different in significant ways from that in the Draft Environmental Impact Statement [DEIS].

The initial assessment of how livestock operations in the EIS study area might be impacted was carried out from November 1996 through April 1997. Since that time, additional field data has been collected and analyzed and further grazing management options have been developed in a number of allotments. As a result of these developments, a number of changes in the grazing impact assessment have occurred which affect the economic impact analysis. The key changes include: the projected total number of allotments requiring a reduction of AUMs has decreased from 82 to 59; the increase in field data has reduced the number of allotments with insufficient information to assess grazing impacts; the projected BLM Range Program cost has decreased and the number of work months required by permittees for herding has also decreased.

For this final impact assessment, an overall 28% decrease in AUM reductions has been projected by the California BLM grazing program. This percentage has been used to adjust the economic impact analysis for the total EIS study area. The county, allotment and permit specific AUM change impact assessment used for the economic analysis in the DEIS is no longer valid. Corresponding complete and updated projections are not available and as a consequence a county, allotment and permit specific analysis is not possible. Some of the general observations and conclusions in the DEIS are still applicable and will be discussed in the local impacts section.

It should be remembered that the grazing impacts estimated by the field offices were conducted in a very different manner than the methods used in actual allotment permit management. The present grazing impact analysis involves some data, some professional judgment and the application of assumptions and estimates in order to make any impact assessment possible. The analysis is not based on a thorough evaluation of complete up-to-date range inventory data for each allotment and permit. The impact statistics, therefore, represent only a probable scenario and not necessarily the actual outcome of implementing rangeland health standards and guidelines.

##### **4.3.4.1 EIS Study Area Impact Analysis**

##### **Income and Employment Impacts**

The grazing impact analyses from each of the ten BLM Field Offices in the EIS study area were summarized and the potential AUM changes totaled. Implementation of the standards and guidelines under Alternatives 1, 2, 3, and 5 could result in a reduction of 11,712 AUM's within the next five years (Shown in table 4.3.4.1 below). This reduction would be expected to continue through most of the implementation phase and until improvement or recovery occurs. If this AUM change were to occur, total direct income in the EIS area could be reduced by \$602,940 plus a loss of 6 jobs over the next 5 years. The comparable short term AUM

change for Alternative Four was a reduction of 25,849 AUMs with a potential total income loss of \$ 1,322,935 and a decrease of 12 jobs over the entire EIS study area. These numbers do not represent a significant impact In the context of California's huge agricultural income and employment, or even in the 1.5 billion dollar California livestock industry. The new projected income loss of \$602,940 represents 0.04 percent of the \$1.5 billion in California livestock sales in the 1992 baseline year.

<b>Table 4.3.4.1: EIS Area Economic Impacts on Total Income and Employment by Alternative</b>			
Alternative	Short Term Net Change in AUM's	Total Income Change (\$)	Total Employment Change
1, 2, 3, 5	- 11,712	- 602,940	- 6
4	- 25,849	-1,322,935	- 12

The possible reductions of 11,712 AUMs represents 3.4% of the total active preference of 340,499. It should be noted that non-use in FY 96 totaled 109,962 AUM's, meaning that livestock operators actually grazed only 67.7 percent of what BLM would permit them. The 32.3% non-use results from a number of potential individual and national reasons. Individual reasons include personal circumstances of the operator, e.g. illness or operation needs. Non-use also results from industry conditions such as poor national livestock prices. For example, in Modoc County, from 1992 to 1996 the county livestock inventory dropped 8,000 animals representing a 15 percent drop. During that time, the average sale price for steers and heifers dropped 21.5 percent. The 3.4 percent potential AUM reduction is roughly one-tenth of the authorized AUMs which permittees have decided not to actually use for various reasons. The non-use cannot be utilized to offset the potential AUM reductions because different allotments and pastures are involved and present laws do not allow flexibility in permit grazing location.

### **Grazing Fee Revenue Sharing**

Grazing fee receipts are variously distributed to the state/counties' range improvement fund and the federal treasury, with the proportion depending upon whether the AUM's involved fall within Section 3 or Section 15 administrative units (see Glossary for definition). A reduction of AUMs would reduce grazing fee revenue. In Alternatives 1, 2, 3 and 5, a reduction of 11,712 AUMs within the next five years would decrease grazing fee receipts an estimated \$15,811 at the 1997 fee level of \$1.35 per AUM. It is estimated that 95 percent of the potential AUM reduction will fall in Section 3 allotments. Accordingly, receipts would be reduced as follows: states/counties \$2,277, range improvement fund \$7,906, and the federal treasury \$5,629.

In Alternative 4, a reduction of 25,849 AUMs within the next five years would decrease grazing fee receipts an estimated \$34,911 at the 1997 fee level of \$1.35 per AUM. Grazing fee revenue sharing would be reduced as follows: state/counties \$5,027, range improvement fund \$17,456, and the federal treasury \$12,429.

The projected state/county grazing fee revenue sharing decreases would not be significant for counties. The decreases to the counties of \$2,277 and \$5,027 represent only 1.1 and 2.4 percent of the 1996 state/county fee revenue sharing of approximately \$203,000. PILT

payments would not be affected by implementation of the rangeland health standards, and PILT is a much more important source of revenues to county governments. The total grazing fee revenue shared throughout California represents only 1.8 percent of the \$10,981,192 state-wide PILT payments.

<b>Table 4.3.4.1(a): EIS Area Economic Impacts on Grazing Fee Sharing by Alternative</b>		
Alternative	Net Change in AUM's	Total Fee Sharing Change
1, 2, 3, 5	-11,712	-\$15,811
4	-25,849	-\$34,911

### **Possessory Interest Tax**

The state of California has an assessment on grazing permits called the Possessory Interest Tax. Grazing permits are seen as the private right to the possession and use of publicly-owned property which has value. The tax is assessed on AUM value as calculated by each county. In Modoc County, the assessed value has four components: permit sale value, cost per AUM, a capitalization rate and the anticipated term of possession. In 1996, assessed value was calculated at \$30 per AUM permit value, plus \$1.35/AUM x a 10% capitalization rate x 10 years term of possession. Because the revenue from the tax on BLM grazing permits is not separately recorded by the counties, it is not possible to state the total amount collected in 1996. The assessed value of an AUM varies from county to county but an average value of \$30 will be used for the present analysis. Because Nevada does not have this tax, the AUM reductions in Nevada are removed from these calculations. The 28 percent overall adjustment produces a reduction in possessory interest tax revenues of \$2,339 under Alternatives 1, 2, 3 and 5 and \$5,537 under Alternative 4.

### **Permit and Real Estate Values: EIS Area**

As noted in Chapter Three, the assessed value of an AUM in a permit, times the number of AUMs allowed, adds to the sales value and taxable value of a ranching operation. If permit value is assessed at \$30 an AUM, then a permit with 500 AUMs is valued at \$15,000. The value of a BLM grazing permit to the total value of a ranch base property varies from region to region in the West in response to a number of variables, including real estate market forces. County Assessors in California report that in the last ten years, there has been roughly a twenty percent decline in permit value assessments because of changes in, and increasing uncertainty about, federal grazing permits. While a continuing decline in permit value is possible, the empirical research does not support making a percentage decline in value assumption and the following analysis uses a constant \$30/AUM figure.

Land values in California vary from region to region with values higher along the coast and in the central valley. Prices are lower, in general, in the northeastern part of the state. A 2,000 acre ranch at the California statewide average price of \$2,215 per acre would be worth \$4,430,000. A 2000 acre ranch at one-third the statewide average, or \$738 an acre, would be worth \$1,476,000. Using a permit value figure of \$30 per AUM, a 500 AUM permit would be

worth \$15,000 and 1000 AUM permit would be worth \$30,000. At the lower land value, the permit values represent only 1 to 2 percent of the total ranch sale value. At the higher land value the permits represent .5 and 1 percent of total ranch value. In California and Nevada, rural land prices have increased an average of 3 percent a year over the last decade. Therefore the land value increase in one year could exceed the total value of the grazing permit to the sale price of the ranch. An even lower per acre value will be used in the following local impact section, but the outcome remains the same. In conclusion, the projected reductions in AUMS will not significantly affect the base property of permits.

### **Additional Permittee/Lessee Expenses**

In addition to the decrease in livestock operator income and permit value, some permittees would have other expenses. In some allotments, it was proposed that herding of livestock would be a part of implementing the Standards and Guidelines. In Alternatives 1, 2, 3, and 5, the need for 89 herding work months was projected for 26 allotments. Using average wage rates for livestock/field workers published in the Nevada 1996 Agricultural Statistics report, the total herding expense was calculated at \$79,995, which, if evenly utilized in all 26 allotments, produced an additional expense of \$3,077 per allotment per season. In Alternative 4, the need for 160 work months in 33 allotments results in an additional total expense of \$143,360. Dividing the total cost evenly among all allotments results in an additional expense of \$4,344 per allotment per season.

### **BLM Range Management Program Cost Impacts.**

In the EIS public scoping process the question was raised of how much it would cost BLM to implement the Standards and Guidelines. Rangeland program expenditures include staffing, field work, and construction and some maintenance of range facilities such as fences and water developments. Program tasks include field inventory, data assessment and incorporation into AMPs and permits, permit administration, and ongoing rangeland monitoring and continuing grazing adjustment as needed.

The BLM Washington Office instructed the field offices to plan for implementation of the Standards and Guidelines within existing staffing and budget levels. As a result, as seen in the following table, there are no projected BLM program fiscal impacts for Alternatives 1, 2, 3 and 5.

The agency budget constraint did not apply to Alternative 4 and the field offices estimated that implementation would require an additional \$1.47 million a year for at least the first five years for the rangeland management program.

**Table 4.3.4.1(c): EIS Area BLM Range Program Annual Fiscal Impacts**

	Alts. 1, 2, 3 & 5 Present Budget	Alts. 1, 2, 3 & 5 % Annual Increase Over Present Budget	Alt. 4: Annual Increased Costs (over present budget) over 5 years	Alt. 4 % Annual Increase Over Present Budget
Personnel	\$ 998,627	0 %	+ \$ 775,800	78 %
Operations	\$ 330,174	0 %	+ \$ 180,000	55 %
Range Projects*	\$ 250,000	0 %	+ \$ 517,400	207 %**
Total	\$ 1,578,801	0 %	+ \$ 1,473,200	93 %

\* Only BLM funds (8100) are noted here. No assumptions are made for allocations of grazing fee revenues returned to the state/counties.

\*\* It is assumed that all of the existing CA BLM funds for range projects will be allocated to project needs. Therefore, only the amount over the existing budget is considered an increase.

### Absentee Permittees and Grazing Program Impacts

The economic viability of livestock ranches and local communities is an important issue in the rural Intermountain West. Often missing in the discussion is the fact that the economic impact of the livestock industry is complicated by the split ownership structure of grazing permits, permit base ranch locations and permit owner residence location. When a BLM grazing permit is owned by a permittee who lives outside the local area there is some affect on the location of revenues and expenditures. Income from livestock sales provides income for both the local ranch workers and the permit owner. Livestock operation expenditures are also affected. Expenditures such as travel, insurance, office expenses, financial services, and the increased possibility of non-local purchases for operations, spread the economic impact of livestock operations between the allotment location county and other locations.

Research on the grazing program in one of the Field Offices in the present analysis illustrates the point. Twenty percent of the operators were absentee permittees/lessees, i.e. did not live in the same county as the allotment, nor did they live close enough to use any local community as their primary source of supplies. These permittees held forty percent of the AUM's in the county administered by that BLM office. Furthermore, some of the operators leased from an absentee permit owner, and that absentee permittee is not included in the statistics above but implies a further dispersion of economic impact.

To varying degrees, the dispersion of economic impacts is common. An examination of grazing permits in three other California Field Offices found that 17, 52 and 53 percent of those who held permits and leases lived in a different county than their allotment and outside the local market area.

Another aspect of grazing impacts involve local governments. The government fiscal situation is also complicated by the geographical split of allotment and operator location. In the same Field Office grazing program examined in detail above, 78 percent of all livestock operators lived in a different county than their allotment location. But PILT payments to counties,



grazing fee revenue sharing and California's Possessory Interest Taxes are directed to the allotment location county. In this example, 78 percent of the BLM grazing program local government fiscal benefits do not go to the county where the livestock operator lives.

The economic implication of these facts is that some percentage of the direct and indirect income impacts (e.g., profits, taxes and purchases) is distributed beyond the local and regional economy. While the present analysis was able to partly incorporate this fact (e.g. the possessory interest tax analysis) the affect of non-local permit holders has not been fully incorporated in the analysis.

#### **4.3.4.2 Potential Local Impacts**

In the DEIS, the 14,001 AUM reductions in Washoe County, Nevada and Lassen County, California represented 87.7 % of all the projected reductions in the EIS study area. In this final document, the BLM grazing program now projects that implementation of the proposed Standards and Guides could result in a total reduction of 11,712 in the next five years. If the Washoe/Lassen proportion of AUM reductions were to remain, the 14,001 AUMS decreases to 10,271 AUMS. Such a decrease would be reflected in all the economic impact variables analyzed in the DEIS, i.e.: income change, employment change, Grazing Fee revenue sharing and Possessory Interest Tax.

The DEIS concluded that there would be insignificant impacts to local county governments and economies and that conclusion remains. Modoc County provides a good example. The majority of the estimated AUM reductions in Washoe County would impact permits held by ranchers in Modoc County. (Although it should be noted that a sizeable number of the permit AUMS are held by individuals who live in Reno or outside the three county region.) But if the AUM reductions resulted in a drop in sales of \$500,000, that figure represents only 0.8% of the total 1995 Modoc County agricultural sales of \$64 million and 0.3% of the total county income of \$150.7 million.

It also cannot be assumed that future total county income from livestock sales would be lower than present because of possible AUM reductions in the affected permits. The DEIS noted the significant impact of changing cattle prices on local economies. From 1992 to 1995, the livestock operators of Modoc County experienced a 58.8% drop in their livestock income because of lower prices and livestock inventory. This represented \$15,881,000 a year! Future increases in cattle prices could offset the limited AUM reductions. In addition, because of the large amount of non-use of federal grazing permits (32.3%), the potential exists for a significant increase in the livestock inventory and subsequent sales.

Although the percentages of AUMS, livestock operators and permits affected by the impact projections are small, the potential exists for some individual livestock operators to be significantly impacted.

How a permanent reduction in AUMS in the three county region area might impact individual livestock operations is affected by a number of basic factors, including: percentage dependency of the operation on federal land forage, the amount of operation debt, the diversity of income for the owners, efficiency of operation, the cost and availability of alternative forage, livestock prices and the increase of land values. Undeveloped land in the rural west is expected to rise in value in response to the increasing demand for land for residential development. For example, in Washoe County, the statistically average ranch is

2,270 acres with an average value of \$289 per acre for a total value of \$656,000. If land values continue in the next ten years as they did in the last ten years, the value of that average ranch will increase by \$209,930 to a total value of \$865,930. In other words, change in real estate values over the next ten years will be a significant factor in ranching economics and will likely be far more significant than AUM changes.

The complexity of the ranching economics situation makes it impossible to predict the outcome of AUM changes on an individual livestock operation with any degree of certainty. Accordingly, the AUM reduction estimates and the following discussion represent only one scenario.

The research on the affect of AUM reductions on herd size has found that there is not a one-to-one ratio. Because of flexibility in operation and/or availability of alternative forage, the decrease in herd size is, in varying degrees, less than the proportional decrease in AUMS. The present analysis uses a model based on a sample of ranches in all of the western states including operations in Northern California. The model predicts that herd size reductions will vary by percentage of AUM reduction and percentage of dependency on federal forage. If all of a livestock operation's animals were on federal land for five months of a year, for example, that operation would have a 42 percent federal forage dependency.

The analytical model projects that a 15 percent AUM reduction could result in a ten percent revenue loss on that permit. For example, an operation with \$50,000 in livestock sales could experience a ten percent loss in ranch income if alternative forage was not available. A ten percent reduction could be difficult but potentially not critical for continued ranch operation. Permits experiencing a 30 percent reduction could experience a 17 to 20 percent livestock income loss on this permit. In these times of low cattle prices, if this permit is the only source of ranch income, it is possible that only the operations with the best of fiscal and operation conditions listed above could continue. For permits in the highest AUM reduction category, if this permit is their only source of a single ranch income, continued operation is in doubt. The exception to this worst case scenario would be if the permit in question is only a small part of a larger unaffected operation, or the owners have a large land equity upon which they can borrow and a plan for future ranch income diversification, or they have outside income.

#### **4.4 CUMULATIVE IMPACTS**

The regulations for implementing the National Environmental Policy Act (NEPA) require federal agencies to analyze and disclose cumulative effects -- effects that result from the incremental impact of an action "when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR 1508.7)

#### **Demographics and Change**

Much of the information in this section is taken from California Fish & Wildlife 2000 (BLM 1989).

Over the last century, California has experienced more rapid population and economic growth than any other developed area in the world. While the population of the United States grew

6.5 fold between 1860 and 1984, California's increased 66 fold, and it has grown by over 7 million just since 1988. California is the nation's most populous state and a world leader in economic, social, and technological change. Over the next 10 years, California's population growth is expected to increase at nearly twice the national rate.

Since the turn of the century, California's population has been largely urban-based, and rural growth was extremely slow. However, the 1970's witnessed a dramatic change in rural growth rates. From 1980 to 1987, 23 rural counties experienced population increases averaging nearly 24%. This trend is expected to continue into the next century.

Urban and rural growth trends will have an increased, powerful influence on resource management policies. Demands for urban and industrial growth will increasingly result in pressure over resource uses and tradeoffs in resource management. Such pressures will be most crucial at the urban-rural interface, where much of California's growth is now occurring.

As urban growth encroaches upon the public and private rural lands, the demands for timber, fuelwood, forage, minerals, recreation, and consumptive and non-consumptive uses of fish and wildlife will assume greater importance.

Projecting agricultural trends in California is difficult. Agriculture may increase or decline depending upon a variety of factors, including international commodities markets, technological advances, and the cost of water. Population growth may stimulate an increase in agricultural production or simply result in fewer exports of agricultural products. An increase in agricultural production would be limited by the acreage of suitable land open to such development. Much of the arable land in California is already in production.

Trends in forage use are easier to predict. Rising costs for livestock production and decreasing demand for beef will tend to decrease the demand for forage on private lands. Instead, a trend to diversify the use of private rangelands will develop, and the demand for living space will increase, resulting in greater conversion of rangelands to urban areas. Forage use on public lands is expected to be somewhat different than on private lands. On public lands, AUMs for cattle and sheep will remain fairly constant or decline only slightly. The traditional problems associated with allocating forage for livestock as well as wildlife will intensify as wildlife habitats elsewhere are reduced and fragmented. Competition between livestock and wildlife for forage will increase.

California is projected to experience the most rapid increases in demand for outdoor recreation of any region of the country well into the next century. Recreation is already the second largest segment of the economy in the western United States; however, the CA Trade and Commerce Agency predicts that travel and tourism *in California* will be **the world's number one economy** by the year 2000 (Poimiroo 1997). Demand for developed recreation sites such as picnic areas, campgrounds, and cabins in scenic areas will increase as the average age of the population increases. As young urban professionals begin raising families, demand for recreational opportunities closer to home will also increase.

While the demand for outdoor recreation is increasing, meeting this demand is becoming increasingly difficult. More and more people are crowding into existing recreation areas because the development of such areas is not keeping pace with demand. Many state and national parks now require reservations for camping and limit the length of stay. Yet, increasing austerity programs in the Federal and State budgets and decreasing staffs are

forcing more and more reliance on volunteers for campground and trail maintenance. Although private lands represent a potentially significant source of outdoor recreation opportunities, problems associated with access and liability will hinder development of recreational facilities. Meanwhile, Federal lands will be forced to absorb the demand until such developments occur.

## **Inter-relationships**

Maintaining the health of the public lands is critical in continuing to provide all of those things that the public expects and demands. Maintaining a healthy, viable, and diverse economy in the rural areas and communities surrounding the public lands is as important to public land management as maintaining a healthy, viable, and diverse ecosystem -- and the latter may well depend upon the first.

The reality is that public lands are inextricably intertwined with private lands throughout the West. There are tremendous pressures on the private rangelands to be sold and developed for rural housing. These private lands often contain the primary water sources for wildlife (game and non-game species, migratory birds, special status species, etc.), livestock, and wild horses and burros. Habitats and migration routes, water quality, recreation and tourism, are all dependent upon, and affected by changes, in the West's farm and ranch situation. Maintenance of these private rangelands in their current status should be a prime consideration to all of those interested in maintaining healthy ecosystems.

Other agencies such as the Forest Service are facing the same pressures and direction to manage their lands. The Forest Service is currently implementing a rangeland health program similar to that of BLM. The Forest Service is preparing environmental analyses for all of their allotments, and in some cases is closing the allotments. This puts increased pressure on both the private and public rangelands near the National Forests.

There is a great need for interagency coordination and cooperation, as well as coordination and cooperation with private landowners, as we increasingly realize that ecosystems are not confined within one agency's jurisdiction, and that what one entity might do will affect his or her neighbors tremendously. To ensure that the anticipated benefits of Rangeland Health and other initiatives truly occur, BLM must work with adjacent landowners so that their actions do not negate the actions BLM will be taking. If BLM and adjacent landowners can cooperate, then the anticipated benefits will accrue; if not, then there will be areas of public land that will not improve to meet its potential due to influences of actions taken on those adjacent lands.

Because of this realization of the inter-connectedness of Federal, State and private lands, there are an increasing number of cooperative and collaborative programs to benefit the environmental health of California and Nevada. Some examples include:

Coordinated Resource Management and Planning efforts in California began in earnest in the 1970s, when several State and Federal agencies signed an MOU. The goal was to foster joint planning efforts across jurisdictional boundaries. CRMP originally focused on range improvement and wildfire prevention by prescribed burning on contiguous lands under multiple ownership. The program has since expanded to include nearly all aspects of land management, including the conservation of biological diversity.

BLM's California Fish and Wildlife 2000 Initiative was started in 1988 to further the goals of conservation and management of fish and wildlife resources on public lands. Main thrusts of the program are cooperation and coordination with other Federal and State agencies and public interest groups to jointly acquire and manage wildlife habitat in the state and to pursue project funding.

An MOU on Biological Diversity was signed by 10 agencies in California in 1991, but now has 37 local, State and Federal agencies participating to coordinate ecosystem management across jurisdictional boundaries.

BLM's National Riparian Initiative, in cooperation with the US Forest Service and the National Resource Conservation Service has been underway for several years. BLM and the Forest Service signed an agreement in 1996 to implement an aggressive improvement program of riparian and wetland areas in the western U.S. A National Riparian Service Team has been established that is working with the agencies, States, and private individuals to assess riparian condition and develop management strategies to improve at-risk riparian areas on both public and private lands.

An MOU for the Coordination of the Management of Undesirable Plants on Federal and State Lands was initiated in California in 1994. There are now 15 agencies cooperating to fight noxious weeds. So far, this effort has established a state-wide data base, agencies are discussing their successes and failures to control weeds, and they are cooperatively seeking funding for weed eradication projects.

The Star-thistle SWAT Team in Lassen County is a partnership between BLM, the Lassen County Agricultural Commissioner, the Farm Advisor, Sierra Army Depot, NRCS, CalTrans, City of Susanville, Lassen National Forest, and CA Dept. of Forestry and Fire Protection to educate private landowners, inventory areas using GPS technology, control known infestation areas, and develop a long range control plan. Last year 55 acres of star-thistle was chemically treated and 20 acres was hand pulled.

Another collaborative management effort specifically designed for a portion of the EIS area is the Modoc/Washoe Experimental Stewardship Program. This program was one of three pilot projects in the western states directed by the Public Rangelands Improvement Act of 1978 to provide incentives or rewards for livestock grazing permittees and lessees to improve range condition of the public rangelands. This program primarily involves the grazing allotments in the Surprise Field Office area and grazing allotments in the adjacent Modoc National Forest. Most of the focus has been in developing consensus based resolutions to resource management problems related to grazing management. This effort still remains as an active participatory decision making group in this area.

Additionally, there are numerous Forest Service programs, and State and private programs that all emphasize coordination and cooperation in maintaining and enhancing the proper function of differing ecosystems on public and private lands within the EIS area.

## **Rangeland Health**

Implementation of the standards and guidelines, cumulatively with the many other state and regional initiatives to protect, enhance, and maintain ecosystem health, will result in improved

rangeland health. There will be less soil erosion, improved vegetative diversity, improved livestock forage, improved upland and riparian habitats, and improved water quantity and quality.

Specifically, improvements to the soils and upland areas will occur slowly over decades and will affect not only upland system components such as soil, water, vegetation, and wildlife, but also downstream components such as water quality and riparian habitat. The most important and basic physical resource on rangelands is the soil (Society for Range Management 1995). Soil conditions, primarily soil structure, influence the movement of air, water, roots, nutrients, and soil organisms. These soil conditions strongly influence plant growth, water infiltration and runoff, and erosion. Utilizing livestock grazing practices which promote upward trends in soil cover, vegetative diversity, and seral stage diversity will have long term positive impacts on the entire ecosystem.

Improvements to riparian areas will result from increased vegetative cover which will result in stabilized aquatic systems, with longer flowing streams, better water quality, protection from erosion and flooding, which will better support wildlife, livestock, municipal water supplies, recreational uses, etc.

Noxious weeds are a growing concern. There will be some immediate small victories. However, even with BLM programs, other Federal and State programs, and cooperative programs as mentioned above, controlling the invasion of noxious weeds and reclaiming those areas already invaded or dominated by weeds will be a long and costly effort. Unless there are considerably more resources budgeted to this effort, we will not see the control of many noxious weeds, much less their eradication, in the foreseeable future.

## **Ranching and Rural Communities**

With or without the standards and guidelines, the demand and need for changes in rangeland management will continue, and these changes may result in declines in livestock use on federal lands over the long term. However, BLM rangeland management policies are not the only factors that affect the western livestock industry and the communities in the study area. There will continue to be pressures from other sources, including: regional population growth; changing demographics, lifestyles, property values, and agricultural subsidies; economic competition and restructuring; and changing laws, policies and practices being implemented by other federal and state agencies.

Over the long term, improved rangeland health will give greater economic stability to many ranchers, better enabling them to continue their traditional ranching lifeways. (However, there may be a few ranchers who will not be able to survive the short-term AUM reductions.) Maintenance of this lifeway, and of the open spaces provided by private ranches, will have a tangible benefit to the quality of life of all of those who live in these rural areas, as well as to those who just visit (of which there will be more and more, as the world becomes increasingly urbanized and people increasingly seek the few remaining wide open spaces).

As mentioned above, of more importance to continuation of the traditional ranching lifeway, and a much greater threat, are the pressures of people seeking out the small communities for recreational activities and "country living." The pressures of other uses on the land, the influx of people with different values, and the opportunities for converting rangeland into housing developments is changing the traditional ranching cultures in many communities, and will

continue to do so during the next century. Along with this are the pressures of a market economy. As reflected in the earlier economic analysis, fluctuations in the price of livestock and the cost of raising livestock will have far greater impact upon the ranching community than will any proposed reductions of AUMs by BLM in either the short- or long-term.

### **Other Programs and Values**

Wildlife species on BLM lands will benefit in both the short and long term. The standards for rangeland health in the preferred alternative would promote the ecological processes and functions that are necessary to sustain native and desirable wildlife populations and communities. Current land use and development trends within California will continue to alter substantial acres of private rangelands and their associated wildlife habitats. The maintenance of the ecological function of BLM rangelands and habitats would help to mitigate wildlife population and community declines that would result from this habitat conversion. BLM lands, in conjunction with other federal, state, and private rangelands managed for "rangeland health," would create a landscape of sustainable wildlife communities, watersheds, and aquatic habitats.

The cumulative impacts of implementing proposed management changes for horse herds on public lands and on National Forests, in conjunction with implementing standards and guidelines (both BLM and the Forest Service), are improved rangeland health conditions in those areas currently failing to meet the rangeland health standards. In most cases, these improved conditions would result in a permanent increase in grass production, with the opportunity to sustain a larger population of wild horses while still maintaining a thriving natural ecological balance within the area.

Future management decisions dealing specifically with wild horses and burros that will be made both on and off the public lands will have more impact upon long-term increases or decreases in wild horse and burro populations, and the health of those populations, than the direct impacts of implementing rangeland standards and livestock management guidelines.

Recreational use of the public lands will continue to grow, with or without implementing rangeland health standards, due to the increasing population pressures within the State and the marketing of California as a vacation destination. In the long term, maintaining the ecological health of the public lands will allow continued use of those lands by recreationists with potential for improved hunting, fishing, camping, and other recreational activities. There will be tangible benefits to America's quality of life gained by maintaining open space on public and private lands, which are maintained and supported to some extent by a grazing economy.

Unfortunately, recreational activities will continue to contribute to environmental degradation unless positive steps are taken to manage those uses. Application of the standards of rangeland health to recreational use is a step that is needed, and will probably be taken within the next five years. If applied as anticipated, this would help prevent some of the negative impacts caused by increased recreational use. If not, we will see increased problems caused by this increased use, and more difficulties in maintaining ecosystem health.

In the long term, Wilderness Areas and Wilderness Study Areas will benefit through the improvement of a healthy and naturally functioning ecosystem. Maintaining or improving the ecosystems through management that reduces livestock impacts will allow the areas to

appear or actually be more natural, and thereby sustain wilderness values. Implementation of standards and guidelines will also reduce potential long term management conflicts between the livestock program and the wilderness management program.

There will continue to be negative aspects to the wilderness program from continued cattle grazing, and the continued human manipulation of natural systems to resolve past livestock impacts as explained in Section 4.2.8.

As long as there is continued access to the public lands, cultural properties will be vandalized and stolen; there will be damage caused by livestock, vehicles, and equipment; and there will be loss of site integrity due to alterations of the site setting and surrounding environment. Again, the severity of effects is related to the intensity of activities. These effects can be caused by grazing activities, but are also caused by recreational activities and other uses of the public lands. These types of activities will continue to increase, putting increased pressure upon cultural resources.

Over the long term, improved rangeland health will provide greater opportunities for Native Americans to utilize resources on public lands that will support the continuation of their traditional lifeways. However, this will be tempered by the increased demands placed upon these resources by other users, especially within the recreational sector.